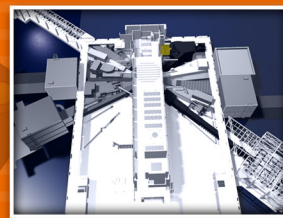


INSTRUMENT

18

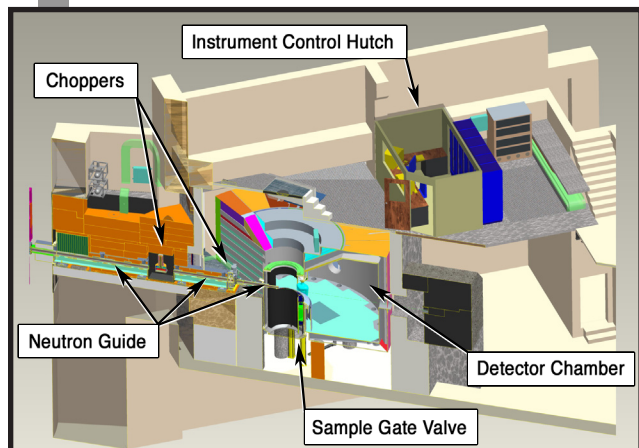
BEAM LINE

Fact Sheet



ARCS – WIDE-ANGLE FERMI CHOPPER SPECTROMETER

The wide Angular-Range Chopper Spectrometer (ARCS) on beamline 18 is optimized to provide a high neutron flux at the sample and a large solid angle of detector coverage.



Cutaway view of the engineering model of the ARCS instrument showing the incident beamline components, sample and detector chamber, and control area.

incident beamline. In addition to the instrument hardware, the ARCS project includes a significant effort for software development.

RECENT SIGNIFICANT EVENTS:

Instrument Development

- A prototype single-crystal goniometer cooled to 10 K is operating at the Lujan Center, Los Alamos National Laboratory.
- A furnace optimized for inelastic neutron scattering is being tested at the Intense Pulsed Neutron Source, Argonne National Laboratory.
- ARCS software developed by the Instrument Development Team based at the California Institute of Technology is undergoing beta testing.
- Detector modules with integrated electronics for position sensitivity have been tested and are in production.

Instrument Construction

- Poured-in-place incident beamline shielding is installed.
- The sample chamber with gate valve is tested and being integrated with the detector chamber at the system manufacturer.
- The beamline guide sections and associated steel shielding before the T-zero chopper are installed.

The spectrometer is capable of selecting incident energies over the full energy spectrum of neutrons, making it useful for studies of excitations from a few meV to several hundred meV. An elliptically-shaped supermirror guide in the incident flight path boosts the performance at the lower end of this range. The sample and detector vacuum chambers provide a window-free final flightpath, and incorporate a large gate valve to allow rapid sample changeout. A new T-zero neutron chopper is being developed to block not only the prompt radiation from the source, but also eliminate unwanted neutrons from the

SPECIFICATIONS

Moderator	Decoupled ambient water
Source – Fermi chopper distance	11.6 m
Chopper – sample distance	2.0 m
Sample – detector distance	3.0 m – 3.4 m cylindrical geometry
Incident energy range	10 – 1500 meV
Resolution (elastic)	2 – 5% E_i
Detector coverage horizontal	-28° – 135°
Detector coverage vertical	-27° – 26°
Minimum detector angle	3°



First section of neutron guide with steel shielding installed on Beamline 18.

FOR MORE INFORMATION, CONTACT THE ARCS TEAM:

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June 2006